भारतीय मानक **IS 8991 : 2023**

Indian Standard

वस्त्रादि — स्लीपिंग बैग के लिये नाईलॉन के कपड़े — विशिष्टि

(पहला पुनरीक्षण)

Textiles — Nylon Fabrics for Sleeping Bags — Specification

(First Revision)

ICS 59.080.30

भारतीय मानक ब्यूरो
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April 2023 **Price Group 5**

Technical Textiles for Sportech Applications Sectional Committee, TXD 37

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Technical Textiles for Sportech Applications Sectional Committee had been approved by the Textiles Division Council.

The nylon fabric covered by this standard is intended for manufacturing of sleeping bags used by the defence personnel.

This standard was first published in 1978. This standard has been again revised to incorporate the following major changes:

a) Requirements for inner fabric, outer fabric and carry bag fabric have been incorporated;
b) Requirements for color fastness to perspiration, elongation at break, water vapour permeability and dimensional change due to relaxation have been incorporated;
c) Sampling plan has been modified;
d) References to Indian Standards have been updated; and
e) BIS certification marking clause has been updated.

The composition of the committee responsible for the formulation of this standard is listed in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES — NYLON FABRICS FOR SLEEPING BAGS — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements for nylon fabric (coated or treated) of inner layer, outer layer and carry bag used in the manufacture of sleeping bags for use in mountaineering equipment or for use on high altitudes.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards listed in Annex A.

3 ATMOSPHERIC CONDITIONS FOR TESTING

3.1 The tests shall be carried out in the standard atmosphere (*see* **3.2**).

3.2 Conditioning of Test Specimen

The test samples shall be conditioned to a state of moisture equilibrium from dry state in standard atmosphere at (65 ± 5) percent relative humidity and (27 ± 2) °C temperature (*see also* IS 6359).

4 MANUFACTURE

4.1 Yarn

Continuous filament nylon yarn shall be used in the manufacture of the cloth.

4.2 Cloth

The cloth shall be woven uniformly and evenly in plain with ripstop weave. The selvedges shall have the same tension as the remainder of the fabric and shall not be unduly thicker than the fabric. The selvedges shall not fold on themselves nor present a corded edge effect. The fabric shall be coated or treated with suitable chemicals so that the water-resistant characteristic is imparted to it. The fabric shall be given a nip-calendar finish.

5 REQUIREMENTS

5.1 The constructional particulars and other requirements of nylon fabric for sleeping bag and carry bag shall conform to the requirements given in Table 1 and Table 2 respectively.

5.2 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

Table 1 Requirements of Nylon Fabric for Inner Layer
(*Clause* 5.1)

Sl No.	Characteristics	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Mass in grams per square metre	70 ± 5	IS 1964
ii)	Tensile strength of the fabric, N, *Min*		IS 1969 (Part 1)
	a) Warp	630	
	b) Weft	385	
iii)	Tear strength, N, *Min*		IS 7016 Part 3 Method A1 (double tear)
	a) Warp	80	
	b) Weft	65	
iv)	Elongation at break, percent, *Min*		IS 1969 (Part 1)
	a) Warp	40	
	b) Weft	40	
v)	Colour fastness to light (dyed fabrics only), change in colour	5 or better	IS/ISO 105-B02
vi)	Colour fastness to washing: Test C (3)		IS/ISO 105-C10
	1) Change in colour	4 or better	
	2) Staining of adjacent fabric	4 or better	
vii)	Colour fastness to perspiration	4 or better	IS/ISO 105-E04
viii)	Water vapour permeability (water method), $g/m^2/day$, *Min*	770	Annex F of IS 16390
ix)	Dimensional change due to relaxation, percent, *Max*		IS 2977
	a) Warp	2	
	b) Weft	2	

Table 2 Requirements of Nylon Fabric for Carry Bag

(*Clause* 5.1)

Sl No.	Characteristics	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Mass in grams per square metre	115 ± 5	IS 1964
ii)	Tensile strength of the fabric, N, *Min*		IS 1969 (Part 1)
	a) Warp	1 200	
	b) Weft	1 050	
iii)	Tear strength, N, *Min*		IS 7016 (Part 3) Method A1 (double tear)
	a) Warp	100	
	b) Weft	90	
iv)	Colour fastness to light (dyed fabrics only), change in colour	5 or better	IS/ISO 105-B02
v)	Colour fastness to washing: Test C (3)		IS/ISO 105-C10
	a) Change in colour	4 or better	
	b) Staining of adjacent fabric	4 or better	
vi)	Nature of coating	Polyurethane	Annex B of IS 16726
vii)	Separation of PU film	On fraying threads in warp and weft directions up to 5 mm after cutting the fabric from any portion, there shall not be a continuous PU film on the areas from where the threads have been removed	—
viii)	Abrasion resistance after 20 000 cycles	No thread breakage	IS 12673 (Part 1 and 2)
ix)	Hydrostatic resistance (Water penetration Pressure head tester 30 cm water column for 60 min)	No penetration and no wetting on coated side	IS 7016 (Part 7)

6 MARKING

6.1 Each roll of fabric shall be legibly marked with the following information:

a) Name of the material;

b) Length and width of the fabric contained in a roll;

c) Year of manufacture; and

d) Manufacturer's name, initials or trade-mark, if any.

6.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

7 PACKING

Unless otherwise specified in contract or order, the

rolls of the nylon fabric shall be packed in accordance with the provisions laid down in IS 2195 or 2194 as applicable.

8 SAMPLING

8.1 The lot shall consist of all the rolls of fabric delivered to a buyer against one despatch note.

8.2 Unless otherwise sampling plan is specified in the contract or order, the sampling plan as given in Table 3 may be used for inspecting and testing of fabric against this standard. The number of rolls to be selected from the lot for assessing manufacture (*see* **4.1** and **4.2**) and testing length, width, ends, picks and weight shall be as per col (3) of Table 3. The number of test specimens to be selected for other tests shall be in accordance with col (5) of Table 3. To ensure the randomness of selection, IS 4905 may be followed.

Table 3 Sampling Plan for Nylon Fabric for Sleeping Bags
(*Clauses* 8.2 and 8.3)

Sl No.	Lot Size	Sample Size	Permissible No. of Defective Samples	Sub-Sample Size (To be drawn from Samples)	Permissible No. of Defective Sub-Samples
(1)	(2)	(3)	(4)	(5)	(6)
i)	2 to 25	3	0	3	0
ii)	26 to 90	13	1	3	0
iii)	91 to 150	20	2	13	1
iv)	151 to 280	32	3	13	1
v)	281 to 500	50	5	20	1
vi)	501 to 1 200	80	7	32	2
vii)	1 201 and above	125	10	50	3

8.3 Criteria for Conformity

The lot shall be declared conforming to the requirements of this standard if the total number of defective samples does not exceed the permissible numbers given in col (4) and col (6) of Table 3 as applicable.

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS 1964 : 2001	Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 1969 (Part 1) : 2018	Textiles — Tensile properties of fabrics: Part 1 Determination of maximum force and elongation at maximum force using the strip method (*fourth revision*)
IS 2194 : 1963	Code for seaworthy packaging of man-made fibre fabrics
IS 2195 : 1964	Code for inland packaging of man-made fibre fabrics and man-made fibre yarns
IS 2977 : 1989	Fabrics (other than wool) — Method for determination of dimensional changes on soaking in water (*first revision*)
IS 4905 : 2015	Random sampling and randomization procedures (*first revision*)
IS 6359 : 1971	Method for conditioning of textiles
IS 7016	Methods of test for rubber or plastics coated fabrics:
(Part 3/Sec 1) : 2022	Determination of tear resistance, Section 1 Constant rate of tear methods (*third revision*)
(Part 7) : 2009	Rubber or plastics — Coated fabrics — Determination of resistance to penetration by water (*second revision*)
IS 12673	Textiles — Determination of the abrasion resistance of fabrics by the martindale method:
(Part 1) : 2014	Martindale abrasion testing apparatus (*first revision*)
(Part 2) : 2022	Determination of specimen breakdown (*second revision*)
IS 16390 : 2015	Agro textiles — Nylon knitted seamless gloves for tobacco harvesters — Specification
IS 16726 : 2018	Textiles — Pouch for ammunition and grenades made of disruptive pattern nylon 6,6 — Specification
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
IS/ISO 105-C10 : 2006	Textiles — Tests for colour fastness: Part C10 Colour fastness to washing with soap or soap and soda
IS/ISO 105-E04 : 2013	Textiles — Tests for Colour Fastness: Part E04 Colour fastness to perspiration

ANNEX B
(*Foreword*)

COMMITTEE COMPOSITION

Technical Textiles for Sportech Applications Sectional Committee, TXD 37

Organization	*Representative(s)*
Wool Research Association, Thane	DR (SHRIMATI) MRINAL CHOUDHARY (***Chairperson***)
Archroma India Pvt Ltd, Thane	SHRI ANJANI PRASAD SHRI ALEX DHANADURAI (*Alternate*)
Arvind Limited, Ahmedabad	DR KUNAL SHAH SHRI SATYAPRIYA DASH (*Alternate*)
Bhabi Multifab Pvt Ltd	SHRI VIJAY ABHICHANDANI SHRI AJAY ABHICHANDANI (*Alternate*)
Coir Board, Kochi	SHRIMATI ANITA JACOB MS SUMI SABESTIAN (*Alternate*)
Garware Technical Fibres Ltd, Pune	DR VIJAY RAMAKRISHNAN DR A. ARPUTHARAJ (*Alternate*)
ICAR - Central Institute for Research on Cotton Technology, Mumbai	DR T. SENTHILKUMAR SHRI G. T. VRINDAIAH (*Alternate*)
Indian Institute of Technology, Delhi	PROF BIPIN KUMAR
Indian Jute Industries Research Association, Kolkata	SHRI PALASH PAUL SHRI PARTH SANYAL (*Alternate*)
Indian Technical Textile Association	DR ANUP RAKSHIT SHRI SUNIL KUMAR (*Alternate*)
Jasch Industries Ltd	SHRI S. K. VERMA
Kusumgar Corporates Pvt Ltd, Mumbai	SHRI SIDDHARTH Y. KUSUMGAR SHRIMATI ANITHA JEYARAJ (*Alternate*)
Office of the Textile Commissioner, Mumbai	SHRI HUMAYUN K. SHRI JAGRAM MEENA (*Alternate*)
SGS Ltd, Mumbai	DR KARTHIKEYAN K. SHRIMATI ANITHA JEYARAJ (*Alternate*)
Sports Goods Manufacturers and Exporters Association, Jalandhar	SHRI VIPAN MAHAJAN SHRI AJAYA MAHAJAN (*Alternate*)
Synthetic and Art Silk Mills Research Association, Mumbai	SHRI RAVI PRAKASH SINGH SHRI SANJAY SAINI (*Alternate*)
Textiles Committee, Mumbai	DR P. RAVICHANDRAN
The Bombay Textile Research Association, Mumbai	SHRI AMOL THITE

Organization	*Representative(s)*
Veermata Jijabai Technological Institute, Mumbai	DR SURANJANA GANGOPADHYAY
Wool Research Association, Thane	SHRI MAYUR BASUK SHRIMATI SMITA BAIT (*Alternate*)
BIS Directorate General	SHRI J. K. GUPTA, SCIENTIST 'E'/DIRECTOR AND HEAD (TEXTILES) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI MAYUR KATIYAR
SCIENTIST 'B'/ASSISTANT DIRECTOR
(TEXTILES), BIS

Bureau of Indian Standards

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